Operating Instructions

Tensile Testers

Z3, Z5, Z10, Z20, Z50

Z3 Z5	Z10	Z20 Z50

1/2015

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1) Introduction

Danger Hints

Warning Danger of crushing!

By the accessible design of the machine there is a risk of crushing

Please make sure that during the adjustment and during
the test sequence no one comes to the area of the machine!

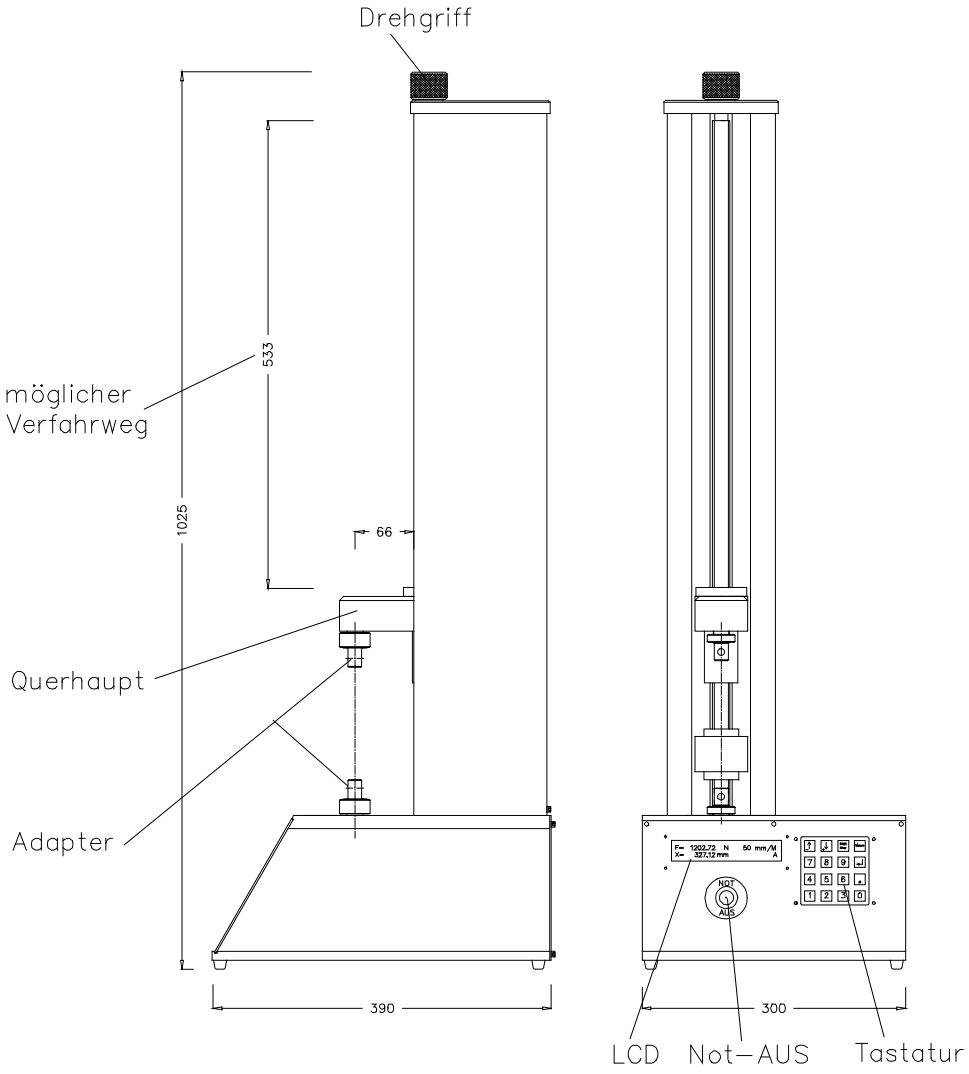
The device may only be operated by trained personnel.

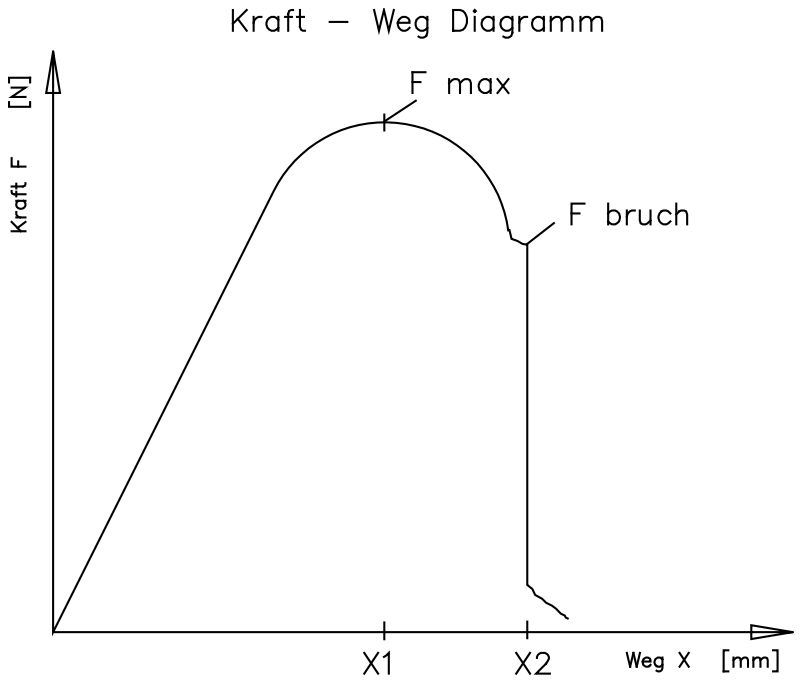
Attention! The load cell can be destroyed by overload!

Especially upon moving the grips
or by lateral load is the danger that the load cell will be destroyed.

Install load cells carefully.
There must be no larger torque pull off the grips
pass through the load cell.
For smaller load cells, we recommend using pneumatic grips

Names


Drehgriff
möglicher
Verfahrweg
533
1025
66
Querhaupt
Adapter
390
300
LCD
Not–AUS
Tastatur


Kraft – Weg Diagramm
Kraft F [N]
F max
F bruch
X1
X2
Weg X [mm]

Notes

limit
The limit switch must be set so that the upper grip do not touch lower grip

Transport

Disassemble load cell.

Z3 Z5 and Z10 machines are provided for voltages 230 VAC or 115 VAC See back side of machine

1) INTRODUCTION

1.01 This manual is to help the operator understand the operation principle of the testing machine electronic panel.
These new testing machines represent a range of easy-to-use compact devices for determining Tension, Compression, Shear, Flexure and other mechanical and physical properties of materials. Due to variations in international standards of force and extension units, the tensile test machines enable the operator to select one of the two standards for Force Units (Newtons and Pounds) and either Inches or Millimeters for the Extension Units.

1.02 All the controls are located on the front panel, which has a large, easy-to-read backlit 2-line LCD display and a numeric keypad. The display unit shows the force and displacement values. Crosshead control keys are provided for moving crosshead up or down, for starting a test, or for getting access to various test parameters, such as, for example, displacement or speed of crosshead. The numeric keypad permits the inputting of test data.

1.03 There may be many aspects of material testing not covered in this operation manual in particular the type of grips used and additional optional equipment (for more information see our webpage http://www.grip.de/)

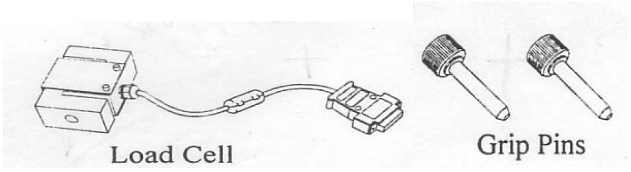
Operating Environment – All machines are designed to operate in temperatures of 0 to 38°C (32 to 100°F) with a non-condensing atmosphere of 10 to 90% Relative Humidity.

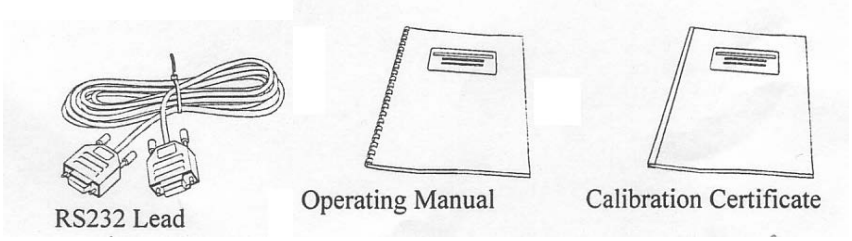
2: CHECKING CONTENTS

The machines are shipped completely assembled except for the optional accessories. The basic machines are supplied with the following items (please insure that these are included for the installation):

- Z-Beam Load Cell at or below the maximum capacity of the load frame;
- two Grip Pins (8 mm) for an adapter;
- operating instruction manual;
- load cell calibration certificate;
- one USB Serial Port Lead for external computer control;
- one 220 V cable.

The following diagrams are to help to identify each item:





Type Number Of Machine:
On the backside of each machine you will find a type number (Typ Nr.). Please use it for future reference.

3) POWER ON CHECKS

Power On / Off Switch.
The On (1) and Off (0) power switch is located on the back side of the machine and should be in the Off (0) position before applying power to the machine.
The picture below indicates the location of the power switch:

1.3 Switching from 220 to 110 volts
Located on the back of the machine Plug inside allows to switch to 110 Volt

Change 220Volt to 110Volt

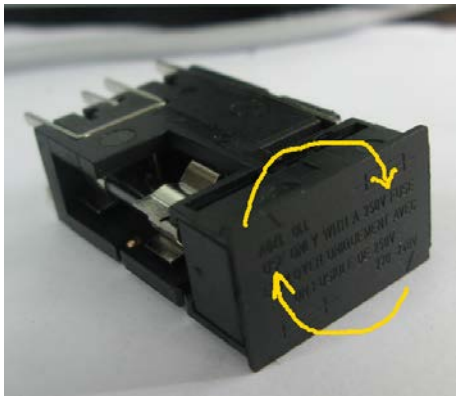
How to switch power supply voltage to 110V

Tooling: You need a flat screwdriver.

Look at backside of your machine. Here is a Power Switch. It looks like this:

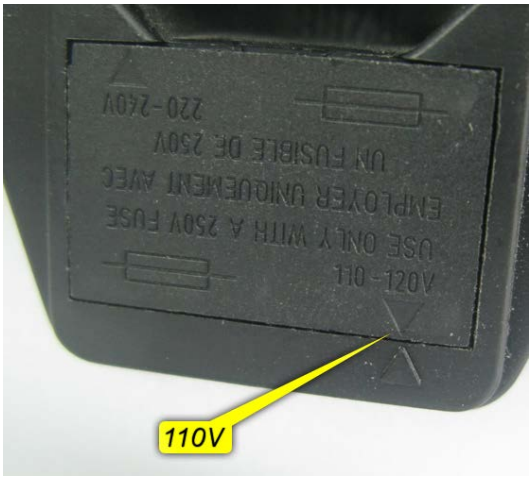
Voltage Mark indicates what voltage is selected. Here is 220-240V.
With screwdriver open fuse box:

Now rotate it like it shown on picture below:



Now insert fuse box into switch. Also be attentive with voltage mark.

Now is selected to 110V. See Picture below. All done.



Emergency Stop Push-Button. The Emergency Stop push-button is located on the front panel of the machine.

To activate the emergency stop you have to push the button. To deactivate the emergency stop turn the button to the left and the button jumps out.

The picture below indicates the location of the emergency stop push-button:

Mechanical Limit Switches.

Before attempting to move the crosshead in either direction it will be required to set the mechanical crosshead limit switches. The purpose of the limit switches is to reduce the travel of the crosshead enabling a safe working area. A typical example is to protect the load cell and attachments for unforeseen overtravel and in doing so avoid a collision. These limit switches are located on the left hand side of the machine.
The figure below shows the location of the mechanical crosshead limit switches:

The limit switches are held in position by a locking screw. To set the limit switch, unlock it by turning the locking screw in the counterclockwise direction and slide to the required new position. To lock the limit switch, rotate the locking screw in the clockwise direction. (Note: To eliminate slippage, re-tighten locking screw securely).
The diagrams below indicate mechanical crosshead limit switches:

Release Upper Limit Switch, move crosshead to a new position, slide limit switch to crosshead striker, re-tighten.

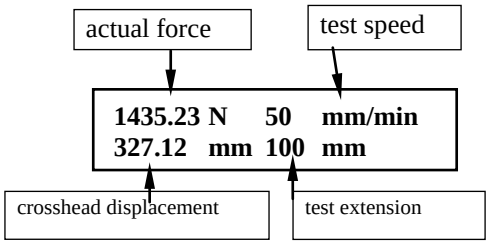
Release Lower Limit Switch, move crosshead to a new position, slide limit switch to crosshead striker, re-tighten.

4) DISPLAY UNIT

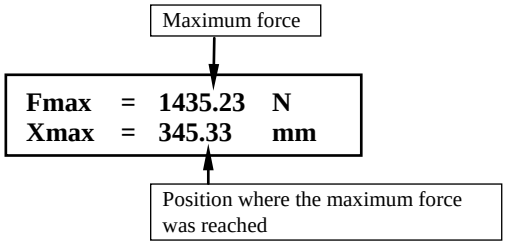
Control Display Panel. This unit contains the LCD Display, the Numeric Keypad and the Emergency Stop push-button.

LCD DISPLAY

When you switch on the machine, you get a message about the Firmware. You will see the following:

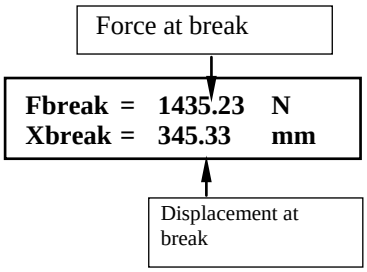


When the test is finished (i.e. when the extension is reached, or the maximum force is exceeded, or the break of the specimen is detected), you see the maximum force of the last test.



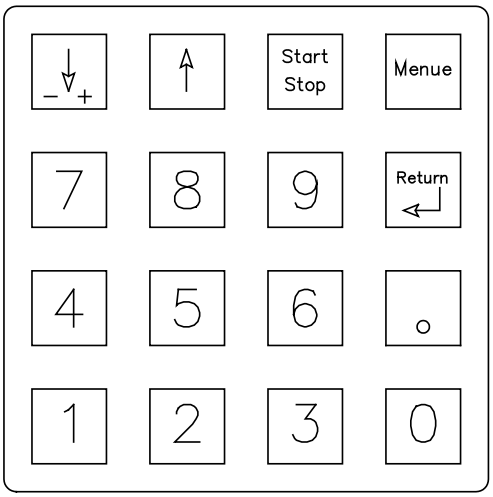
By pressing the [2] key the operator gets the information about the force at break.

.



5) Menue Keypad

Numeric Keypad. These keys are used for entering numeric values on the LCD-Display (Speeds, Extension, etc.).



Crosshead Control Keys. There are two crosshead directional arrows:

↓	The down arrow is used for lowering the crosshead and for inputting negative values.
↑	The Up arrow is used for raising the crosshead.
S	This key starts and stops a running test. If the [Start – Stop] key is pressed during a test, the procedure is interrupted. The same happens if you press any other key.
M	With the menu key, the operator can make settings for the next test. The adjusted settings should be confirmed with the Return key.
↵	By pressing the [Return] key, the operator stops or returns the crosshead to zero extension after the test.
0	This key will zero the Force and Extension display.

1	This key shows the maximum Force and the referring Extension of the last test.
2	This key shows the Force and the Extension of the Rupture.
3	This key has no function.
4	This key has no function.
5	This key is used to enter the configuration menu. This menu is protected with the password (09122).
6	This key has no function.
7	This key has no function.
8	This key allows switching to constant force mode.
9	This key has no function.

MENU

M

The [Menu] Key
With this key the operator can make settings for the next test.
The adjusted settings should be confirmed with the [Return] key.

If you press the [Menu] key, you will see the following:

ENDPOS - means “Test Extension”.

The range is possible from 1 mm to 540 mm (for the smallest version of the machine), except for the length of grips and a specimen. Positive values mean tensile test; negative values mean compression test. In order to change from “–“ to “+” you have to press the [Down] key.

V means “Test Speed”.

The range is from 0,5 mm/Min to 500 mm/Min (only positive values are possible).

F-LIMITS - means “Force Limit”.
The Force Limit can be used to protect tooling rated lower than the load cell capacity, to end a test when that force is reached.

F-DELTA - means Force Delta.
Force Delta is the sensitivity for detecting the rupture of a specimen, i.e. the value of 200N means, if during a tensile mode the load decreases more than 200N/50ms, the rupture is detected and the test is finished.

If the value is too low, rupture is not detected by the machine and runs till the end of the set movement

F-MAN - means Jog Speed.
The range is possible from 1 mm/Min to 500 mm/Min.

6: CONFIGURATION

Change of Configuration

by pressing "Menu" during power on or "5" key you activate the config menu.
to prevent accidental change of configuration it protected by a code

proceed as follows:

after pressing "5" key, the display shows: " Paßwort ? "
now type "09122". If you entered the code correctly,
you can either load the pre-set values or change them.
display shows: "Grundeinstellung ?"
"Ja"=0

by pressing "0" the machine load the following values:
by pressing "Return" you skip the defaults.

defaults values:
language (Sprache)
1=deutsch 2= english 3= italiano 4= français

UNITS ½ mm N / in lbf (1lbf = 4.44822 N / 1 in = 25.4 mm)

LOADCELL	*[N]*	*2000*	
load cell Sensitivity ("Lastzellenempfindlichkeit")	*[mV/V]*	*3.165*	*(example)*
Calibration factor ("Kalibrierfaktor")		*[FAK]*	*1.000*

by pressing "0" you start a Calibration program

F limit H (maximum force for Hardware)	*[N]*	*1500 [N]*
repositioning speed („Rücklaufgeschwindigkeit")	*[VR]*	*500mm/min*

F(0) [N] *(preload) .*

these settings are stored in a non volatile ROM and are re-established after every power on.

We recommend to note all changes on a book.

Machine type

'Machine type' can be set to 1..6 value with following meaning:

'1'	*DC-Servo 40W 500mm*	*Z3-X500*
'2'	*DC-Servo 40W 1200 mm*	*Z3-X1200*
'3'	*DC-Servo 80W 500mm*	*Z5-X500*
'4'	*DC-Servo 80W 1200 mm travel*	*Z5-X1200*
'5'	*AC Servo 300W 10 kN 700mm travel*	*Z10-X700*
'6'	*AC Servo 300W) 10 kN 1200mm travel.*	*Z10-X1200*

In machine without program (empty) this parameter is automatic set to '1'.

For more information see info-hex-3-65.txt file.

By pressing the [M] key during the switching on the machine until the "Password" is shown on the Display, or by pressing the [5] key the operator enters the configuration menu. To prevent an accidental change of configuration data, this menu is protected with the password.
The procedure is as follows:
By pressing the [5] key the display shows "Password?"; the operator should press "09122" and after that the settings of the machine can be changed.

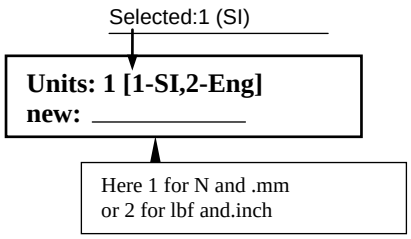
Language Selection:

With these keys the operator can choose the desired language and with the [Return] key confirm the choice.
The operator can also select the desired language:

1 =German
2 =English
3 =Italian
4 =French
5 =Spanish
6 =Danish

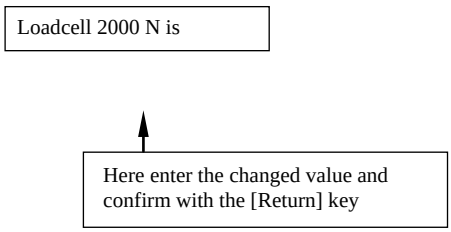
(add a new language
http://www.youtube.com/watch?v=LDNiQRc5TIQ&feature=youtu.be)

The Selection Of The Used Units:

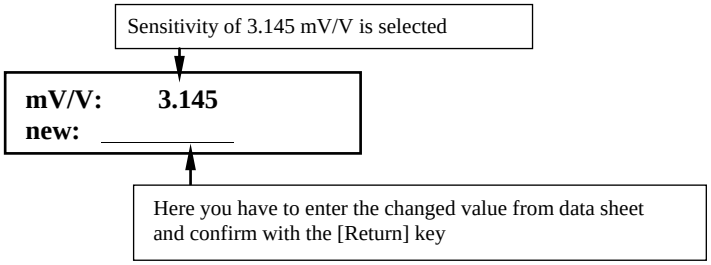


If you use the system "Millimeters/Newtons (mm/N), you have to press [1]; if you use the system "Inches/Pounds (in/lbf), press [2].
By pressing the [Return] key you go to the next Menu-Entry.

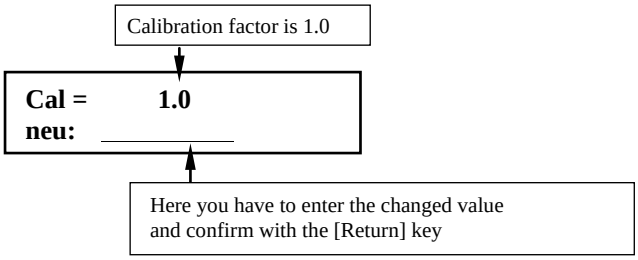
6.03 Load Cell Capacity:



Load Cell Sensitivity:

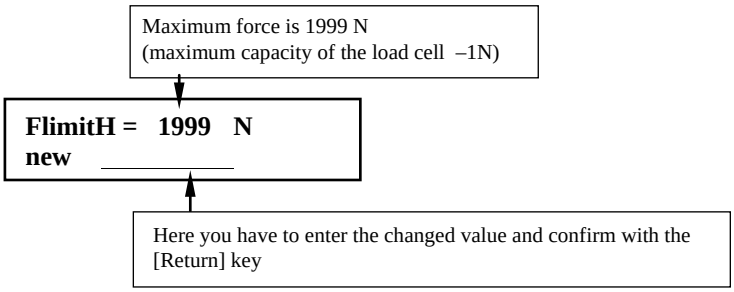

Sensitivity of 3.145 mV/V is selected
mV/V: 3.145
new:
Here you have to enter the changed value from data sheet
and confirm with the [Return] key

Calibration Factor:



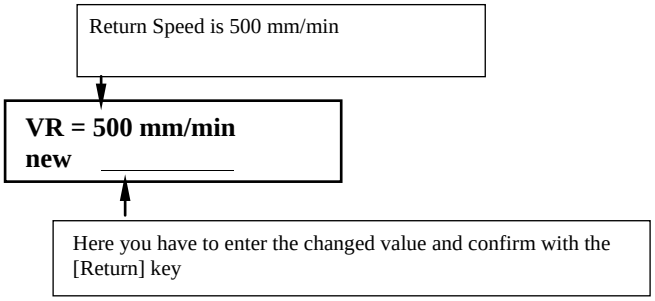
If you enter [0]", you start a calibration program (see: "Change of the load cell").

Maximum Force of the Machine:

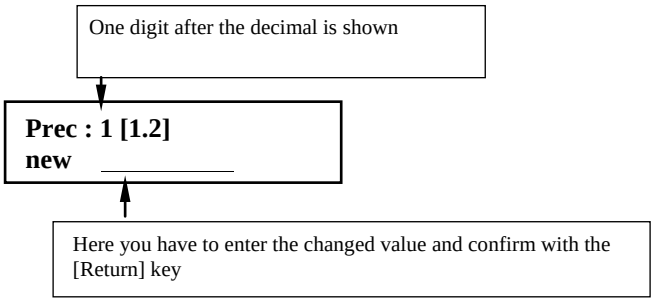

Maximum force is 1999 N
(maximum capacity of the load cell –1N)
FlimitH = 1999 N
new
Here you have to enter the changed value and confirm with the
[Return] key

When the amount of the force is exceeded, the machine is automatically switched off and an emergency message is shown.

Return Speed: Return Speed is the speed for the Return key ("Return home function").



Digits After The Decimal Point:



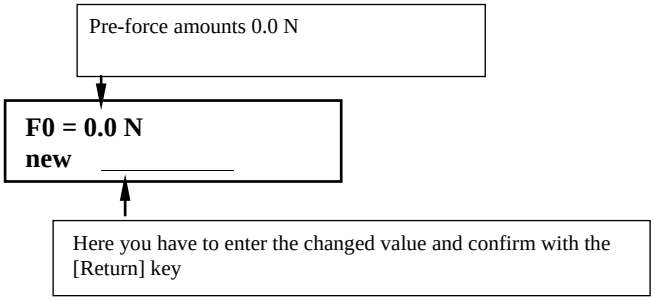
“Prec” means “Precision.

Type Of The Machine:

The “Machine type” can be set from 1 to 6 with the following meaning:

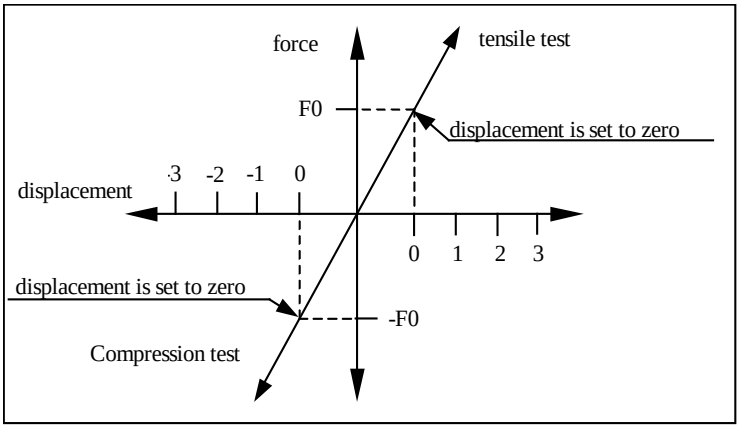
1 for TH 2730 3 kN (40 W, 500mm);
2 for TH 2730 3 kN (40 W, up to 1200 mm (a long version));
3 for TH 2730 5kN (80 W, 500 mm);
4 for TH 2730 5 kN (80 W, up to 1200 mm (a long version));
5 for TH 3630 10 kN (2x80 W, 500 mm);
6 for TH 3630-1000 10 kN(2x80, up to 1200 mm (a long version)).

6.10 Pre-force setting:



If the actual force exceeds the pre-force during the tensile test, or drops below the pre-force during the compression test, the extension measurement begins with 0.00 mm. This function is ineffective when the pre-force amounts 0 N.
All settings are power-failure safe stored.

PreForce Function



7) LOAD CELL

Limits of the Load Cell

The Load Cell may not be deformed more than max. 0.2 mm in pulling direction!

Doing pressure tests, ensure that the Load Cell does not bend out to the side!

Specially using low force Load Cells there is a high risk of damage by permanent bending of the Load Cell, which is due to the Load Cells construction principle.

In case there is a danger of Load Cell Overload, we recommend using special protection equipment.

After overload damage, the Load Cell may still show measurements, but is not linear anymore.

To ensure the accuracy of a Load Cell a calibration test should be done with multiple different weights.
If necessary adjust the calibration factor.
We only can provide the Load Cell Function as guaranteed by the manufacturer.

Any warranty claims which are due to mal operation or overload will not be accepted.

Zero adjustment

By pressing " 0 " before testing a **Zero adjustment is done.**

As the clamping of probes does already produce forces, a **Zero adjustment** should always be done before testing.

change of load cells

In order to change the load cell you have to do the following:

Switch off power on the machine

-
- loosen the screw at the cross bar
- mount new load cell with the screw at the cross bar
- put load cell plug into the connector at the back side of the machine
- Switch on the machine again and wait to the end of the self-test procedure
- press "5"
- type Password: "09122"
- save old parameters on a piece of paper and type the new values

  - set new parameter for ‘Loadcell’ e.g.: 2000 [N]
  - set new parameter for ‘mV/V’
    (load cell sensitivity) e.g.: 3.165 [mV/N]
  - set new parameter for ‘Cal’ (calibration factor) to "1"

set calibration factor with weight
put a calibration weight at the load cell, e.g. : 10 kg = 98.0665 N
(**

the display should show a similar value
E.g. the display shows 95.6 N the calibration factor must be increased:
from 1 to 1.03745 (use calculator)

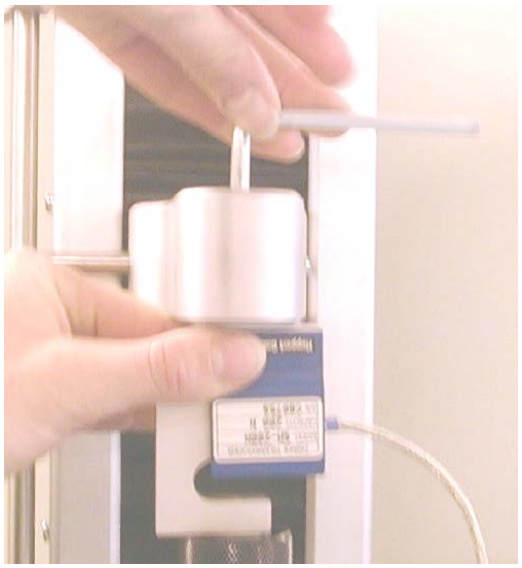
check the changes with the weight again!
** (this is dependent to your location and valid for 45° northern / e.g. north pole 98.32 N / at the Equator 97.80 N

Mounting procedure of Load Cell

Caution!
Small type of load cells can easily be deformed especially by torsion forces.

Never put torsion forces on the Load cell while tightening or loosening probes and clamps

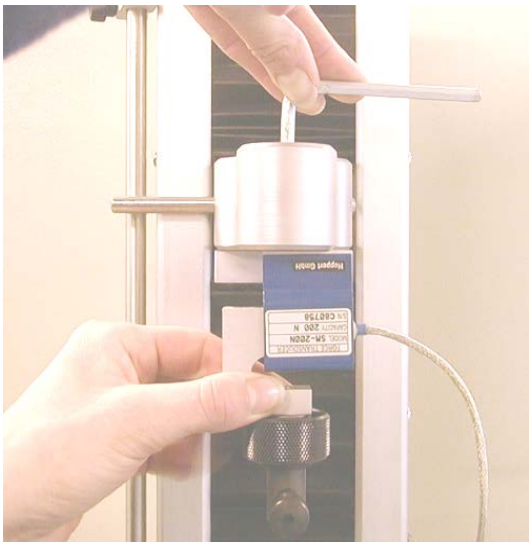
only hold the load cell at the upper part!----------
right ↓



✓ OK.

---

wrong↓
do not mount like this! Load cell is likely to be destroyed .



✗ never

Load cell have a fragile area with tiny parts and adjusted DMS strips inside.
These thin strips can easily be deformed permanently by torsion forces.

Fitting Load Cell:

The Z-Beam type load cell are mounted under the moving crosshead. Your machine will be provided with a load cell equal to or less than the maximum capacity of the machine. Connect the load cell by plugging the 5 pin connector into the load cell socket on the rear side of the machine.

Limits of the Load Cell:

Load Cell should not be deformed more than maximum 0,2 mm in both directions.
When doing pressure tests, be sure that you do not bend a load cell to the side. Using a low force load cell, there is a high risk of its damage by permanent bending of the load cell which is due to its constructive principle. If there is danger of the load cell overload, we recommend using special protection equipment which we also provide
After overload, the load cell still shows measurements but they are not linear anymore.

That is why we recommend using pneumatic grips for low force tests to avoid an accidental destruction of the load cell when tightening the clamps.
To ensure the accuracy of the load cell, a calibration test should be done with different weights.

If it is necessary, adjust also the calibration factor.
We can only provide the load cell function as guaranteed by the manufacture. Any claims which are due to false fixing or overload are not accepted.

Zero Adjustment:
By pressing the [1] key before testing zero adjustment is done.
As the clamping of a specimen already produces force zero, adjustment should be always done before each test.

Calibration With a Weight:

In order to increase the accuracy of the machine you have to calibrate with a known weight.

It is done as follows:

- remove load from the load cell (if there is any);
- set calibration factor to “0.

The display shows now:

(Do not be confused that the display shows the messages in German - this program is used seldom, that is why we did not translate it into English. On the right side of the page you see the messages translated into English).

mit Gewicht eichen weight calibr. 1=ok	Calibrate with weight Weight calibr. 1=ok

Confirm with the [1] key, then you see:

Lastzelle entlasten weiter mit Taste	Remove load from the load cell

Please care that there is no vibration - then press any key.

Last aufbringen weiter mit Taste	Burden the load

Now hang a known weight on the load cell, wait - then press any key.

Faktor bestimmen weiter mit Taste	The machine calculates the factor

Press any key.

Faktor bestimmen 15%	The machine calculates the factor 15%

The machine calculates now the factor automatically, it counts from 1 till 100%. When the procedure is completed, the machine expects that the operator enters the force that the load cell was loaded with.

Last: 38.460 N Neu:	The pre-set force is 38.460 N Enter the loaded force

Now you have to enter the force that the load cell was loaded with.

38.46 N Last ok=1 again=9	The actual force is 38.46 N Force ok =1 again=9

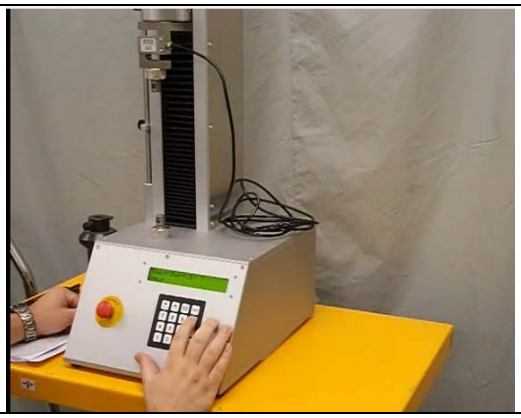
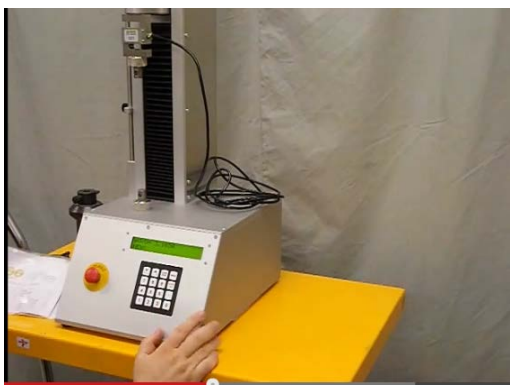
Because of the vibrations of the machine the last digit of the force reading is not stable.
The average value should be the same as the weight. When you are satisfied with the calibration, press the [1] key and you will end the routine. If you press the [9] key, you start the procedure once again.
The display shows the calculated calibration factor.

Faktor ist gesetzt: 1.003	The factor is set: 1.003

	Video http://youtu.be/Kpsg_-LxmYM calibrate with a weight (balance)

Multiloadcellsystem

In case of usage of several load cells we recommend to active the Multiloadcell Routine

	activate Multiloadcell Routine http://youtu.be/QTXwEAASxMQ
	change of load cell with the Multiloadcell Routine http://youtu.be/UP3VIIoy_mo with subtiteles http://youtu.be/BRnBhRSHG2w
	change load cell calibrate a second load cell with Auto calibrating http://youtu.be/4nMdiXiluKI with subtitles http://youtu.be/y_sCxeLPJkM
	change load cell, calibrate and set loadcellnumber in Multicalibration Routine http://youtu.be/fy9mkMBP9DM

8) INTERFACE USB

Table of orders

ORDER	FUNCTION	EXAMPLE	RESULT
	End of commands is always $ * Decimal separator is '. '		
'A'	Actual readings	A$	Force ;Way
'B'	Last readings (rupt. value)	B$	Frupt Xrupt
'C'	Write configuration data block	C$	Receive Conf. Data
'Dxxx'	Set F delta	D20$	F delta=20N
'E'	Return to zero position	E$	Return button (to 0,00mm)
'Fxxx'	Set limit of force in test (F limitS)	F200$	F limitS=200N
'G'	Read configuration data block	G$	Send Confg. data to comp.
'H'	Stop machine	H$	Stop button
'H?'	Ask for listing command set	H?$	Command set listing
'Jxxx'	Set return speed	J200$	VR=200 mm/min
'K0'	Set normal mode	K0$	Machine in Normal mode
'K1'	Set Constant Force Regulation mode	K1$	Machine in CFR mode
'Lxxx'	Set end position for test	L100$	X=100mm
'M'	Last readings (max. value)	M$	Fmax Xmax
'N'	Read nominal load	N$	2000 (Load cell = 2000N)
'O'	Reset Load cell and position counter	O$	0,0N 0,00mm (“0” button)
'O1'	Reset position counter only	O1$	2,0N 0,00mm
'O2'	Reset Load cell only	O2$	0,0N 7,34mm
'Pxxx'	Set preforce (F0)	P0.4$ *	F0=0.4N
'Qxxx'	Set constant force to keep (in CFM)	Q200$	Force to keep = 200N
'QTxxx'	Set time to keep (in CFM)	QT60$	Time to keep = 60sec
'QHxxx'	Set stiffness factor of sample (1..10)	QH1$	1 – slow regulation “hard”
'R'	Begin the Test	R$	Start button
'RHxx yy'	Begin the Hysteresis Test with: xx –delay time, yy –cycles (repeating)	RH10 2$	2 cycle with 10 sec waiting time
'RESET'	Hard reset	RESET$	Reset of system
'S'	Ask for Status	S$	Condition of machine
'SER?'	Ask for serial number of machine	SER?$	0001 (max 20char.)
'SER:'	Set serial number in machine	SER:0001$	Set ser.# 0001 (max 20char.)
'T'	Read software ver. nr. in Flash mem.	T$	" HEX-4.35 7. 2005 "
'U'	Ask for actual units (US or SI)	U$	1-SI system, 0-Us system
'Vxxx'	Set speed testing speed	V100$	V=100mm/min
'Xxxx'	Move to position with “Return speed” (Jxx)	X20$	Drive to position of 20mm

Serial communication port

8) Interface USB

Serial communication port:

Pin 1=DCD
Pin2=RxD
Pin3=TxD
Pin4=DTR
Pin5=GND
Pin6=DSR
Pin7=RTS
Pin8=CTS
Pin9=RI

Data format :

Pin 1=DCD
Pin2=RxD
Pin3=TxD
Pin4=DTR
Pin5=GND
Pin6=DSR
Pin7=RTS
Pin8=CTS
Pin9=RI

Data format :

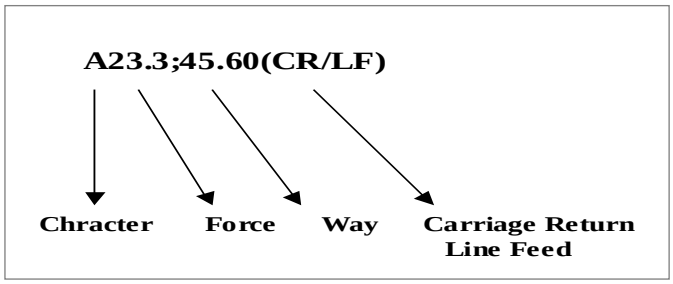
Baud rate	38400
Data	8
Parity	None
Stop bits	1
Protocol	noneranfer Example:

None Stop bittocol
RTS/CTS Handshake

examples:

Character possibility:

„A“ -actual readings
„M“ -last readings of max. value(Fmax ; Xmax)
„B“ -last readings of break(Fbreak ; Xbreak)
„S“ -status of machine
„E“ -machine return to zero position
„R“ -test is running
„OK“ -reset of Load cell and position is done
EOF (ASCII=26)-end of data, end of test



Force = 23.3N
Way = 45.60mm

C 251 Compiler Communication procedure.

```
…
switch(combuffer[0])
    {
     case 'R':versuch(0);
                    break;
     case 'E':moveto(wegoffset,Tconfig.VR);
                    printf("E\n\r");
              break;
     case 'H':mstop();
              break;
     case 'O':adnullen();
                    printf("OK\n\r");
                    break;
     case 'A':printf("A% 6.*F;% 6.2F\n\r",Tconfig.nachkomma,getkraft(),getweg());
                    break;
     case 'M':printf("M% 6.*F;% 6.2F\n\r",Tconfig.nachkomma,fmax,xmax);
                    break;
     case 'B':printf("B% 6.*F;% 6.2F\n\r",Tconfig.nachkomma,frupt,xrupt);
                    break;
     case '$':resetproc();
                    break;
     case 'V':combuffer[0]=' ';
                    T=atof(combuffer);
                    if ((T>1)&&(T<1000)) Tparablock.SPEED=T;
                    break;
     case 'L':combuffer[0]=' ';
                    T=atof(combuffer);
                    Tparablock.endpos=T;
                    break;
     case 'X':combuffer[0]=' ';
                    T=atof(combuffer);
                    moveto(T,Tconfig.VR);
                    break;
```

```
     case 'S':printf("S%d\n\r",status);
```

Delphi 3.0 Receive procedure (for exp.)

```
procedure Tform1.receive(s:string);
 const status:word=0;
 var   s1,s2:string;
       index1,index2:word;
        y:tvaluesx;
 begin
    case s[1] of
    'A':      Begin
                  index1:=pos(';',s);
                 s1:=copy(s,2,index1-2);
                 index2:=pos(#10,s);
                 s2:=copy(s,index1+1,index2-index1-1);
                 panel2.caption:=s2+'mm';
                 panel3.caption:=s1+' N';
              end;
    'R':      Begin
                 if status=0 then
                      begin
                                                    xychart1.clear;
                                                    timer1.enabled:=false;
                                                    inc(status);
                      end;
                 index1:=pos(';',s);
                 s1:=copy(s,2,index1-2);
                 index2:=pos(#10,s);
                 s2:=copy(s,index1+1,index2-index1-1);
                 panel2.caption:=s2+'mm';
                 panel3.caption:=s1+' N';
                 Y[0]:=strtofloat(s2);
                 Y[1]:=strtofloat(s1);
                 Y[2]:=0;
                 Y[3]:=0;
                 y[4]:=0;
                 xychart1.add(y);
              end;
     #26:  begin
                 status:=0;
                 timer1.enabled:=true;
                 speichern1click(self);
              end;
    end;
 end;
```

9) Upload Hexfile

The HexProgramm in the single board computer can be changed (updated) .

For this, the program serves "Loader.exe" and the file ..... hex "

However, please observe the setting values of the tensile testing machine for safety's note before!

After the loader is started, select port number then select the hex file.

The machine must be switched on, may not run in a test
The loader transfers the hex file to the machine and starts the program.

The current manuals and the latest software packages, see

http://www.grip-soft.de/

Questions or problems with the software, please send e-mail to

service@grip-soft.de

10) Special Programs

F(0) Mode

if F(0) Mode is set to " 1 " x will automatically be set to 0
if load will come to a special value (after touching the sample)
used for compression tests

Constant Force Regulation

with key "8" you can switch to force regulation

with key "Menue" you can set force

for example, 5 N makes tension 5 N
for example,5N makes compression 5 N

if you press "Start" key, force regulation will be activated
machine drives slowly to this force

if you press again on key "8", you will come back to normal constant speed regulation

in constant force regulation modus you can change settings depending on hardness of material from 1 to 10

Push button Menu of tensile tester

if material is weak push 1 reaction speed is high
if material is hard push 10 reaction speed is low

11) Accessories, Maintenance

1 USB cable
1 110/220V cable
2 pins 8 mm for adapter
1 certification of load cell

grips see also http://www.grip.de

Maintenance

Keep all parts clean. Work with vacuum cleaner not with compressed air.

Grease: We propose grease for bearings and ball screw Klüber ISOX NBU 15 (all 300 hours of active usage – bal bearing has a greasing posibility in center of machine remove cap in center of protection sheet) do not use oil

12) Windowssoftware

you can download actual software, manual and hexfile from our software homepage

http://www.grip-soft.de

see also http://www.gripsoft.de/THSSD/THSSD.html

Software installation:
1. Download software here http://gripsoft.de/current/USB/THSSD_R1_USB.zip

2. Download USB FTDI chip driver here
http://www.ftdichip.com/Drivers/CDM/CDM%20v2.12.00%20WHQL%20Certified.exe

3. Install USB driver

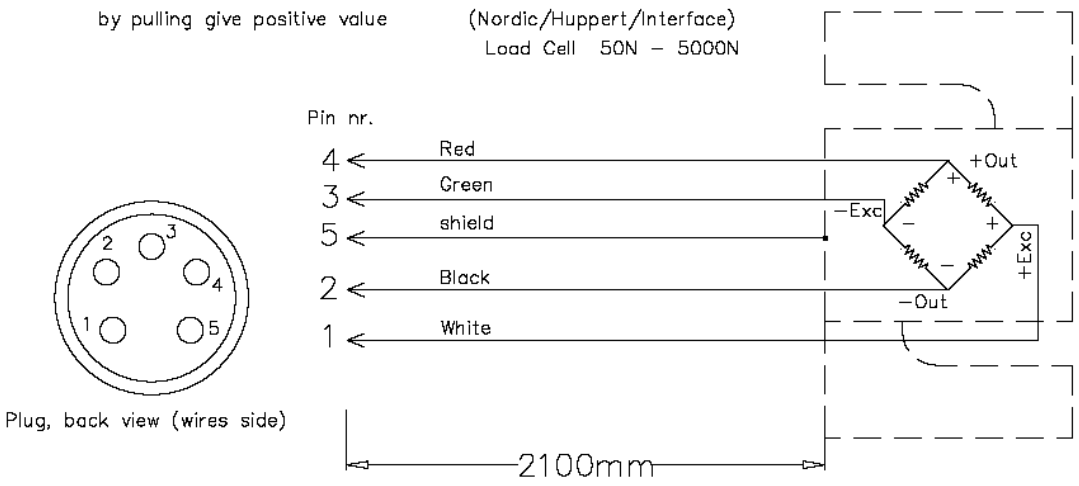
4. Unpack software

5. Connect and power on ZPM machine

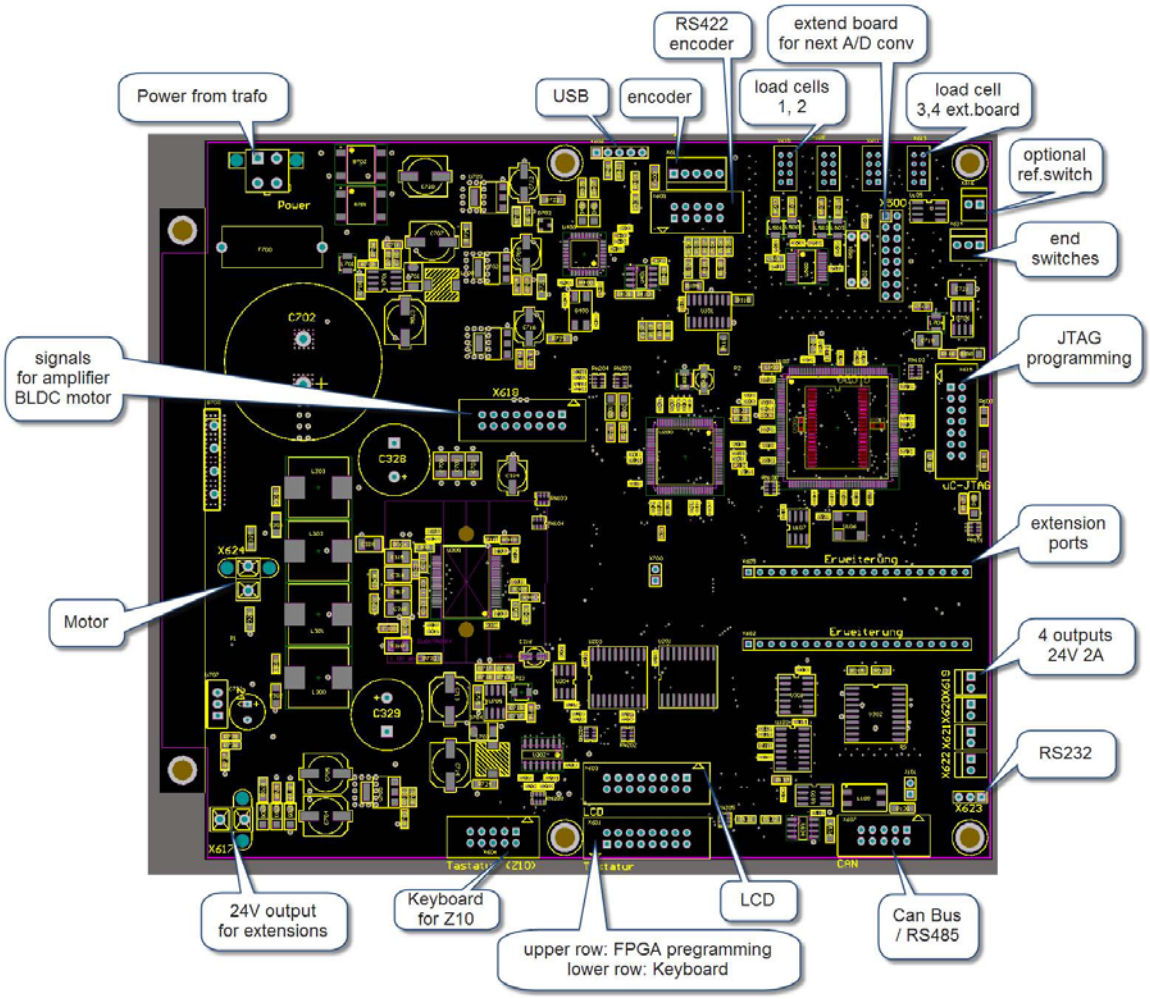
6. Run software (executable file). Software is portable.

Online help you can find here http://gripsoft.de/THSSD/THSSD.html

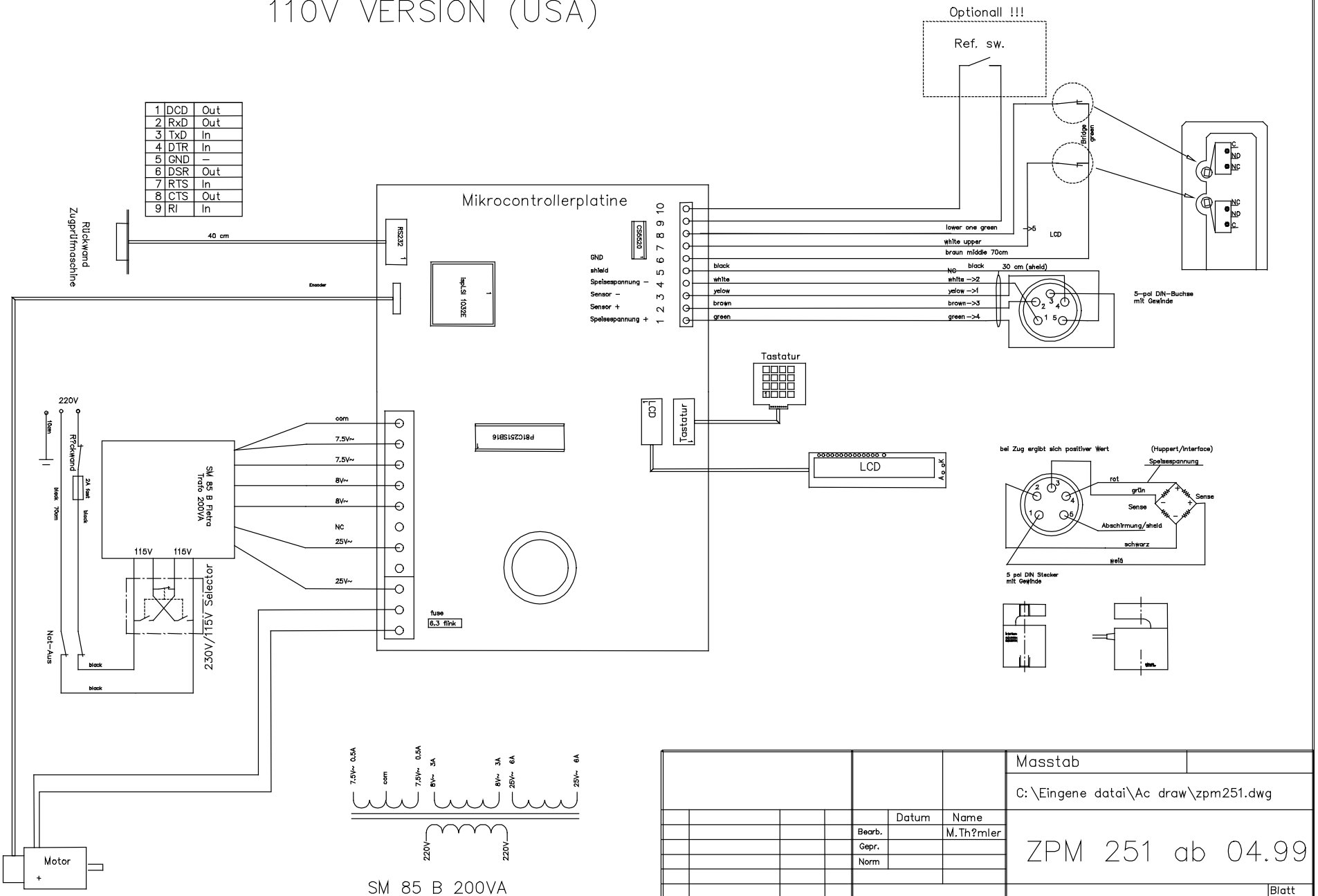
13) Electric Plan



Main Board



110V VERSION (USA)



1	DCD	Out
2	RxD	Out
3	TxD	In
4	DTR	In
5	GND	–
6	DSR	Out
7	RTS	In
8	CTS	Out
9	RI	In

					Datum	Name
				Bearb.		M.Th?mler
				Gepr.		
				Norm		
Zust	Änderung	Datum	Name			

Masstab

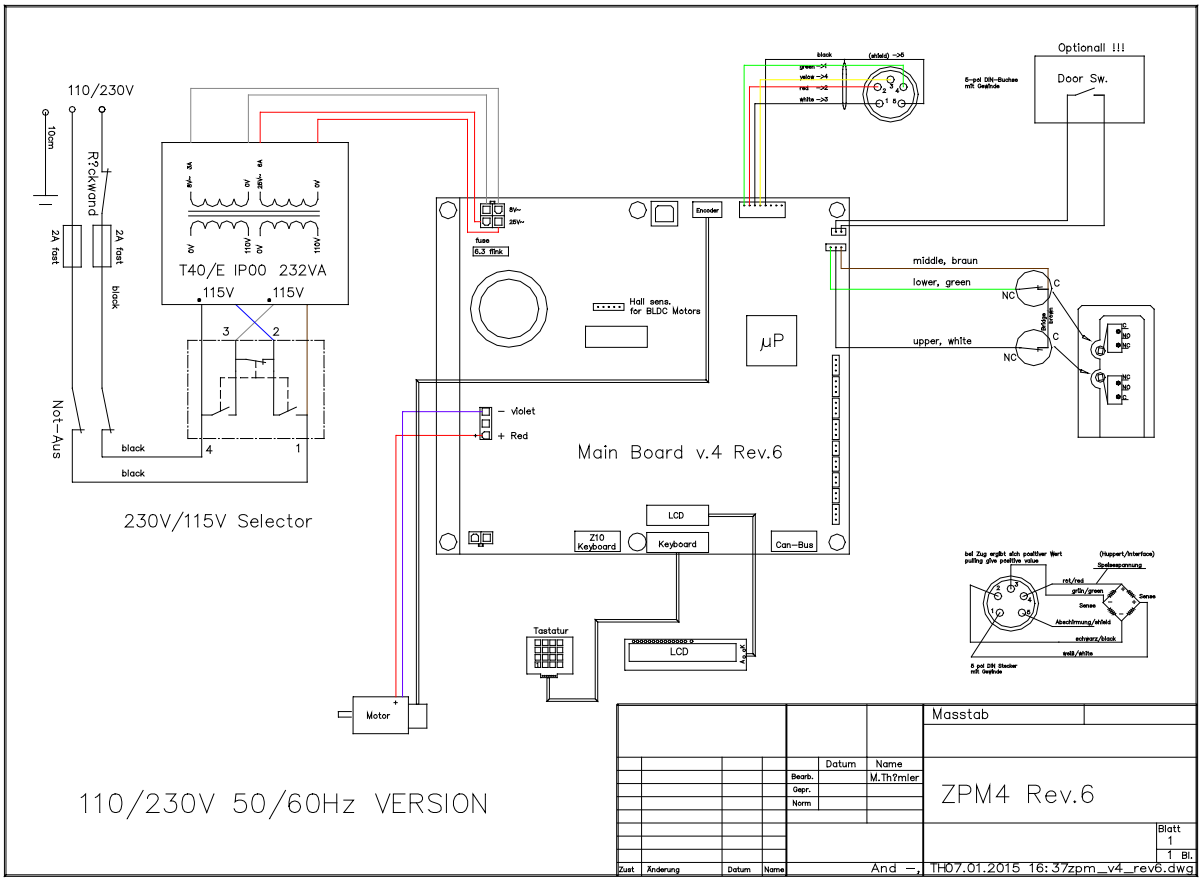
C:\Eingene datai\Ac draw\zpm251.dwg

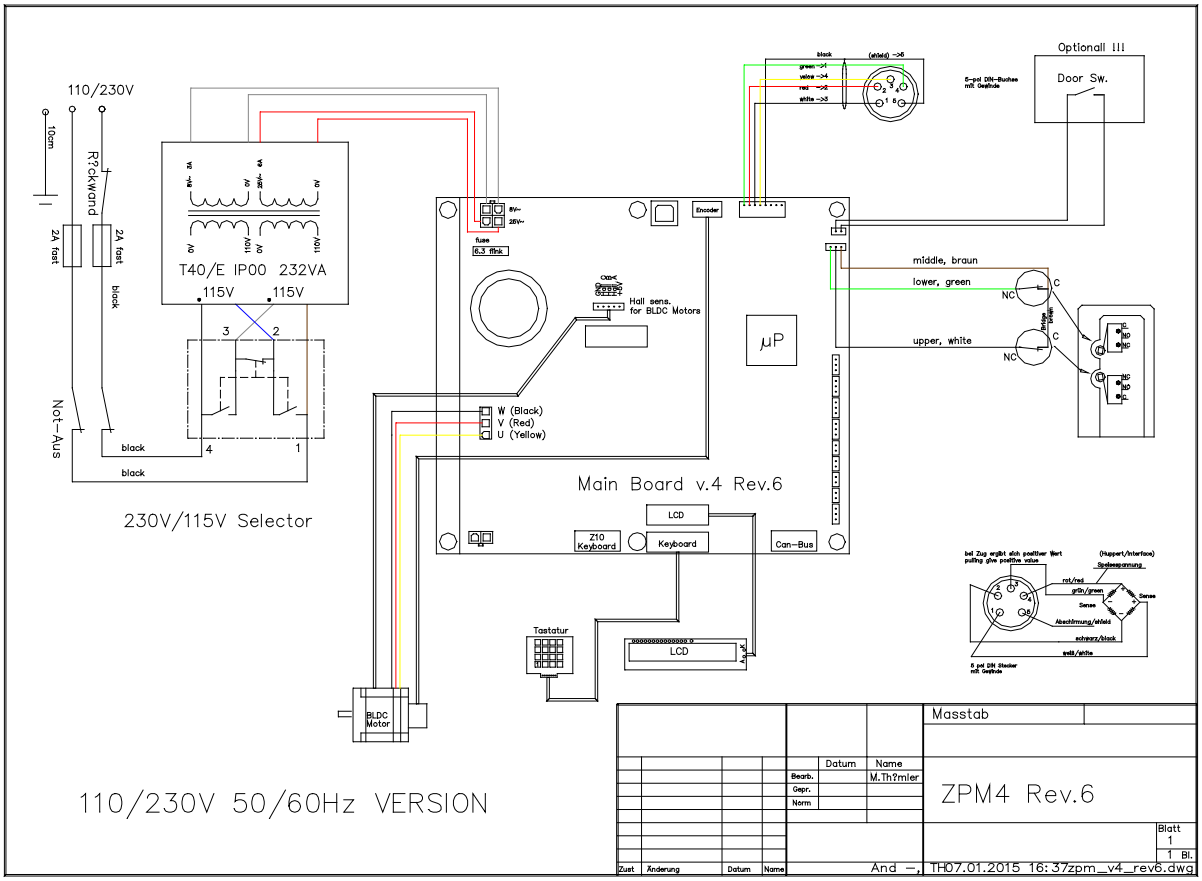
ZPM 251 ab 04.99

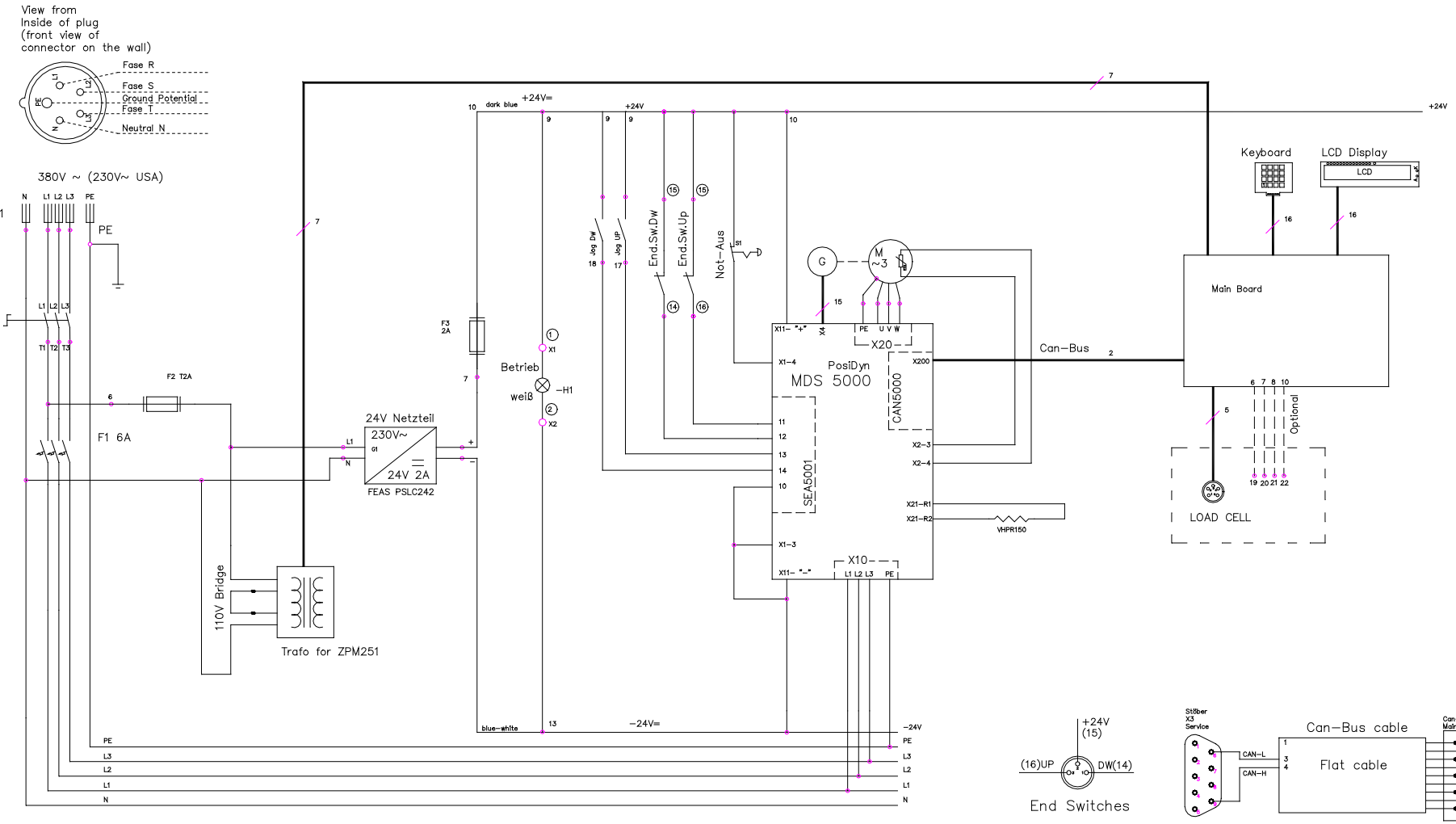
Blatt 1

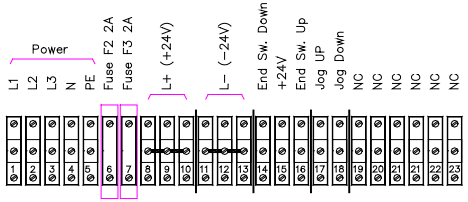
1 Bl.

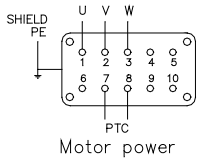
Andrzej27.04.99 16:15zpm251.dwg


110/230V
10cm
R?ckwand
2A fast
2A fast
black
T40/E IP00 232VA
115V
115V
Not-Aus
black
black
230V/115V Selector
Optionall !!!
Door Sw.
Encoder
fuse
6.3 ftrk
Hall sens.
for BLDC Motors
µP
middle, braun
lower, green
upper, white
NC
C
Relay Driver
– Violet
+ Red
Main Board v.4 Rev.6
LCD
Z10
Keyboard
Can-Bus
Tastatur
Motor
Masstab
Datum
Name
Bearb.
M.Th?mler
Gepr.
Norm
ZPM4 Rev.6
Blatt
1
1 Bl.
Zust
Änderung
And –, TH07.01.2015 16:37zpm_v4_rev6.dwg
110/230V 50/60Hz VERSION

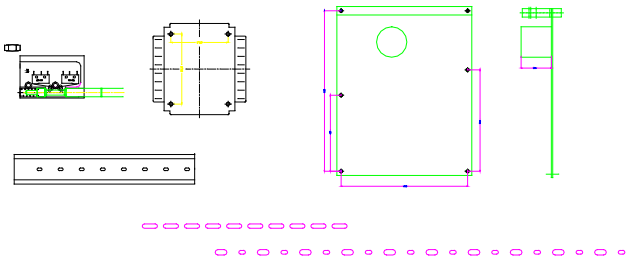

110/230V
10cm
R?ckwand
2A fast
2A fast
black
T40/E IP00 232VA
115V
115V
Not-Aus
black
black
230V/115V Selector
Optionall !!!
Door Sw.
Encoder
fuse
6.3 ftrk
Hall sens.
for BLDC Motors
µP
middle, braun
lower, green
upper, white
NC
C
Relay Driver
W (Black)
V (Red)
U (Yellow)
Main Board v.4 Rev.6
LCD
Z10
Keyboard
Can-Bus
Tastatur
BLDC Motor
Masstab
Datum
Name
Bearb.
M.Th?mler
Gepr.
Norm
ZPM4 Rev.6
Blatt
1
1 Bl.
Zust
Änderung
And –, TH07.01.2015 16:37zpm_v4_rev6.dwg
110/230V 50/60Hz VERSION

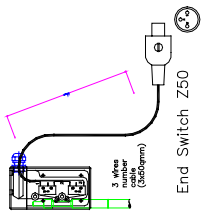

View from
Inside of plug
(front view of
connector on the wall)
Fase R
Fase S
Ground Potential
Fase T
Neutral N
380V ~ (230V~ USA)
X1
PE
Q1
F1 6A
F2 T2A
F3
2A
24V Netzteil
230V~
24V 2A
FEAS PSLC242
110V Bridge
Trafo for ZPM251
Betrieb
weiß
-H1
+24V=
dark blue
Jog DW
Jog UP
End.Sw.Dw
End.Sw.Up
Not-Aus
St
G
M
~3
PosiDyn
MDS 5000
SEA5001
CAN5000
X20
X10
X200
X4
Can-Bus
Main Board
Keyboard
LCD Display
LCD
Optional
LOAD CELL
VHPR150
blue-white
-24V=
+24V
(15)
(16)UP
DW(14)
End Switches
Stäber
X3
Service
CAN-L
CAN-H
Can-Bus cable
Flat cable
Can-Bus
Main board

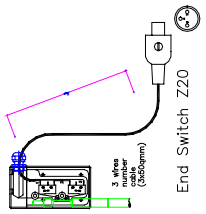

Power
L1
L2
L3
N
PE
Fuse F2 2A
Fuse F3 2A
L+ (+24V)
L- (-24V)
End Sw. Down
+24V
End Sw. Up
Jog UP
Jog Down
NC

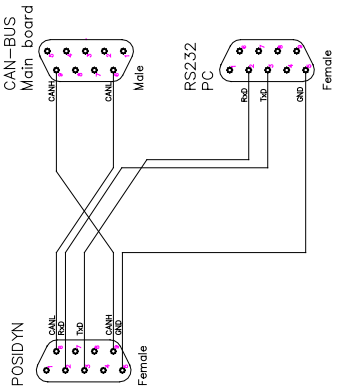

SHIELD
PE
U
V
W
PTC
Motor power

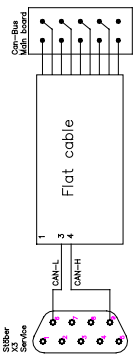
Z20-Z50-SP1

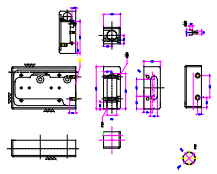


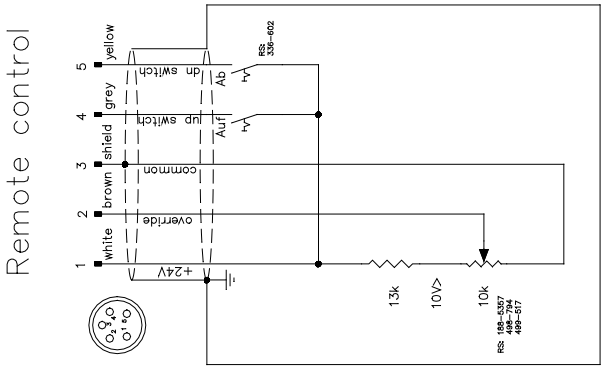

End Switch Z50
3 wires number cable (1m/3m/5m)

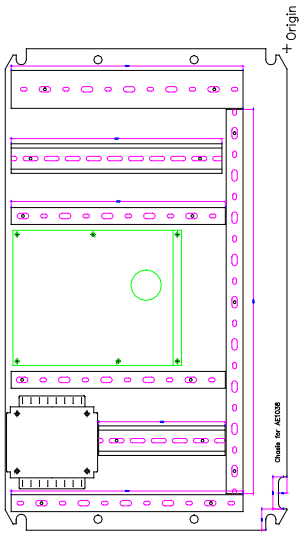

End Switch Z20
3 wires number cable (1m/3m/5m)

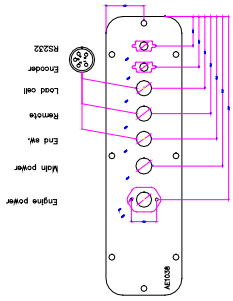

CAN-BUS
Main board
CANH
CANL
Male
RS232
PC
RxD
TxD
GND
Female
POSIDYN
CANL
RxD
TxD
CANH
GND
Female

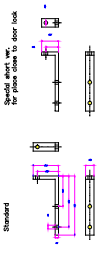

Can-Bus
Main board
Flat cable
1
3
4
CAN-L
CAN-H
Stöber
S3.1
Service

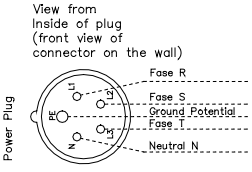


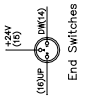

Remote control
yellow
grey
shield
brown
white
5
4
3
2
1
Up switch
Down switch
Auf
Ab
override
common
+24V
13k
10V>
10k
RS 336-602
RS 189-6357
498-794
498-877

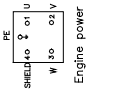

+ Origin
Diode for AE1038


RS232
Encoder
Load cell
Remote
End sw.
Main power
Engine power
AE1038


Special short wire for photo cells in door jack
Standard

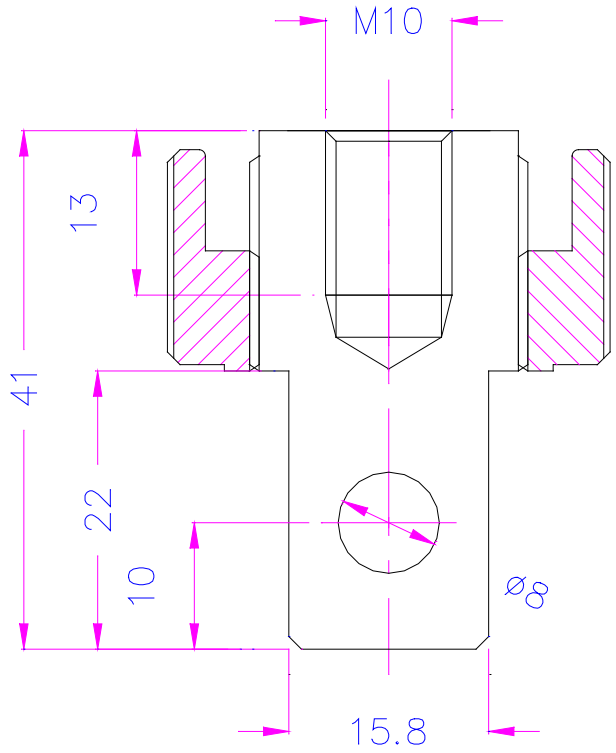

View from
Inside of plug
(front view of
connector on the wall)
Power Plug
L1
L2
L3
PE
N
Fase R
Fase S
Ground Potential
Fase T
Neutral N


+24V
(16)
DM(14)
(16)UP
End Switches

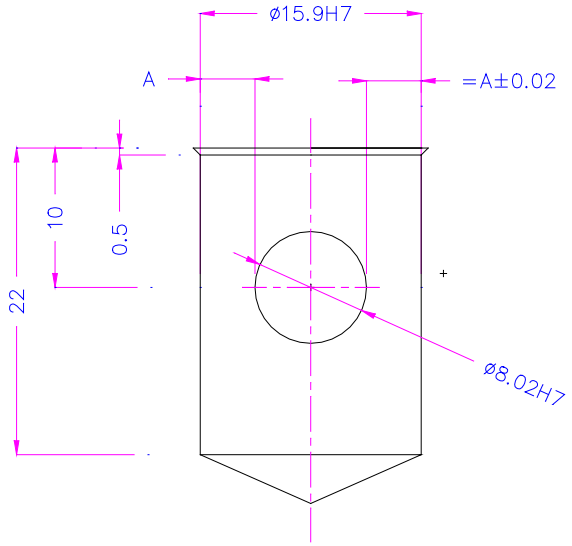

PE
U
V
SHIELD
W
Engine power

14) Dimensions

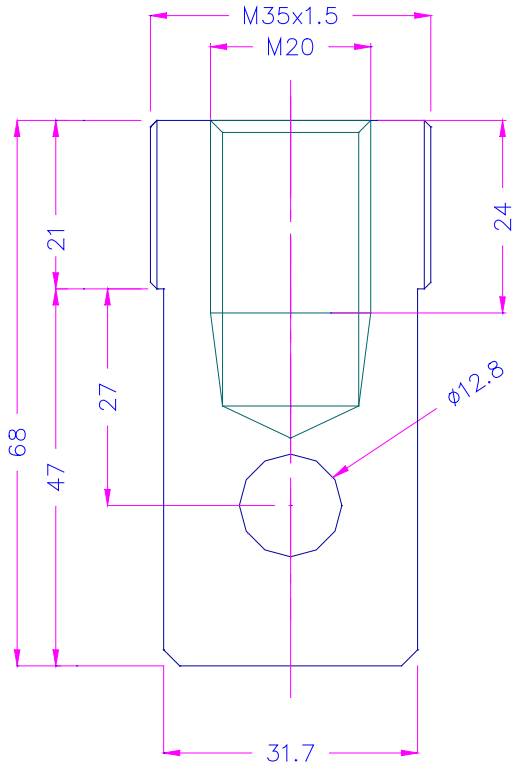
Adapter Z3 and Z10



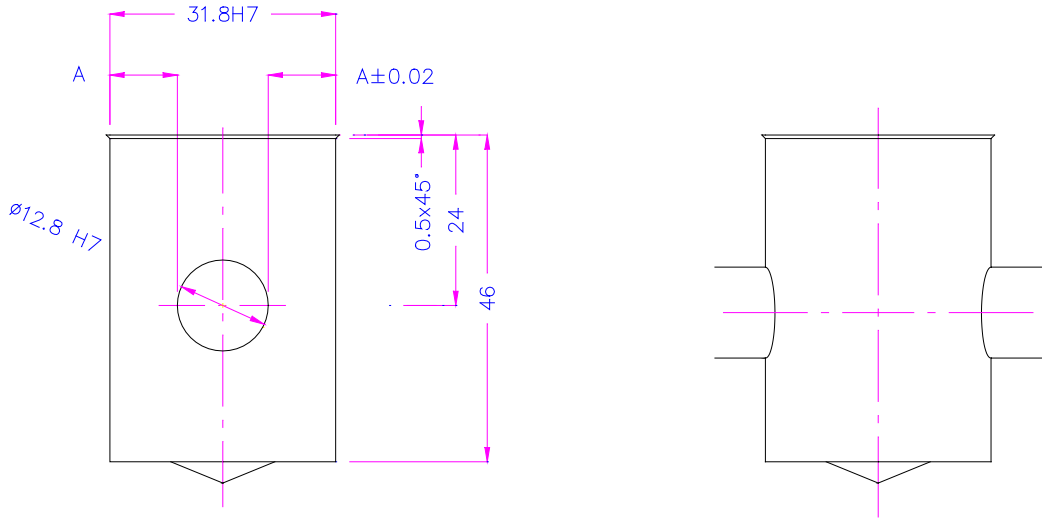
THS438–15.8–M10



Adapter size Z20, Z30 Z50

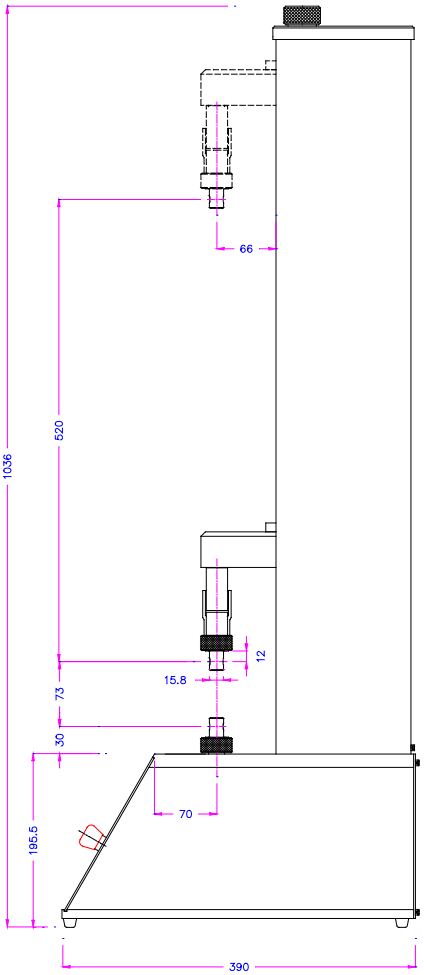


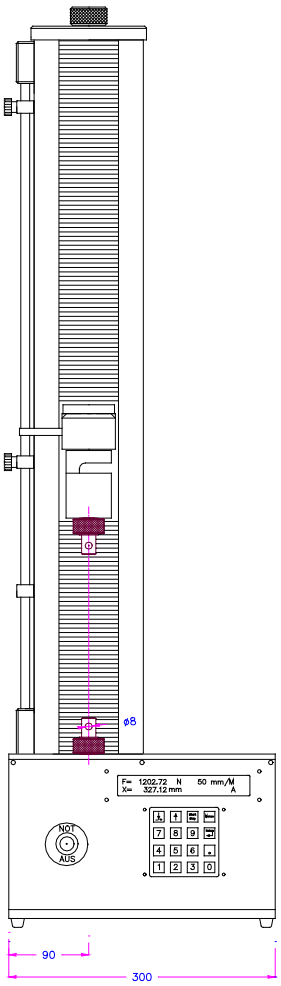
THS438−317−M20

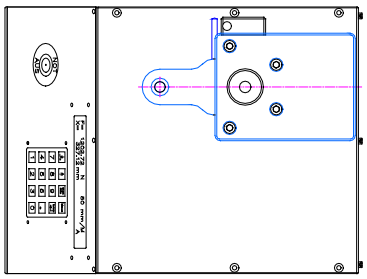


Af318

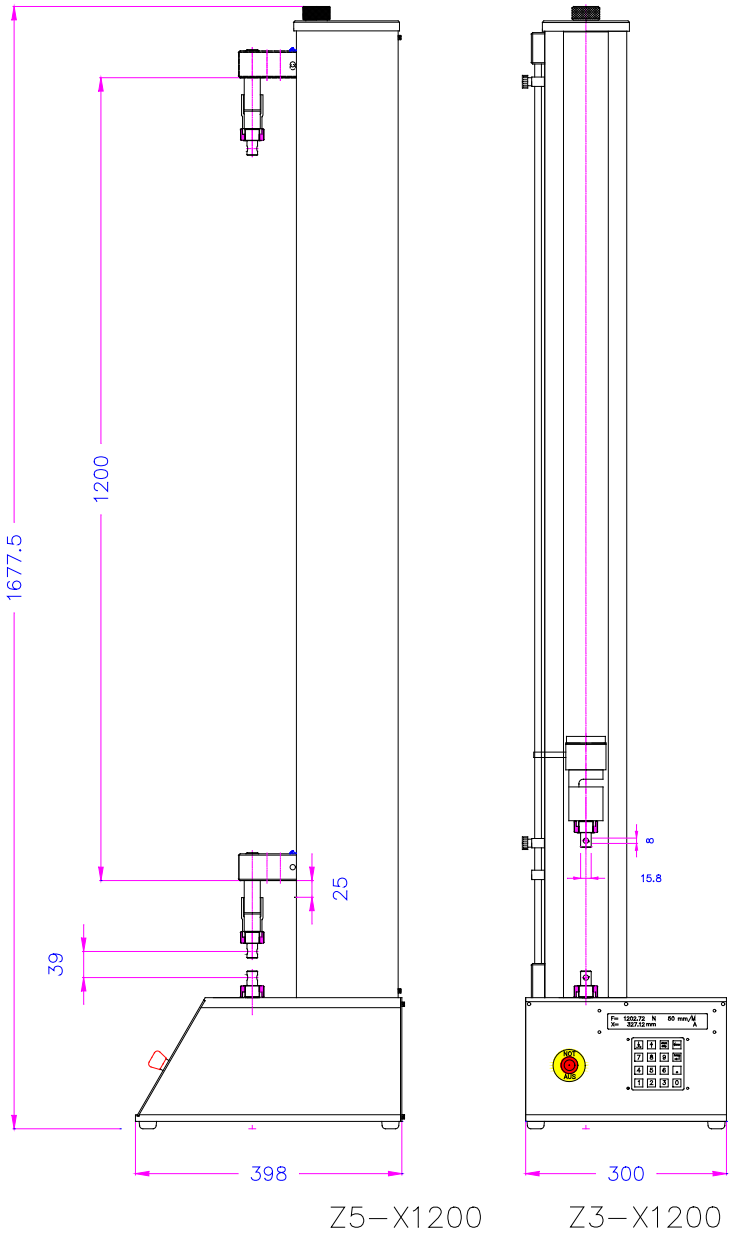
Z3-X500 Z5-X500

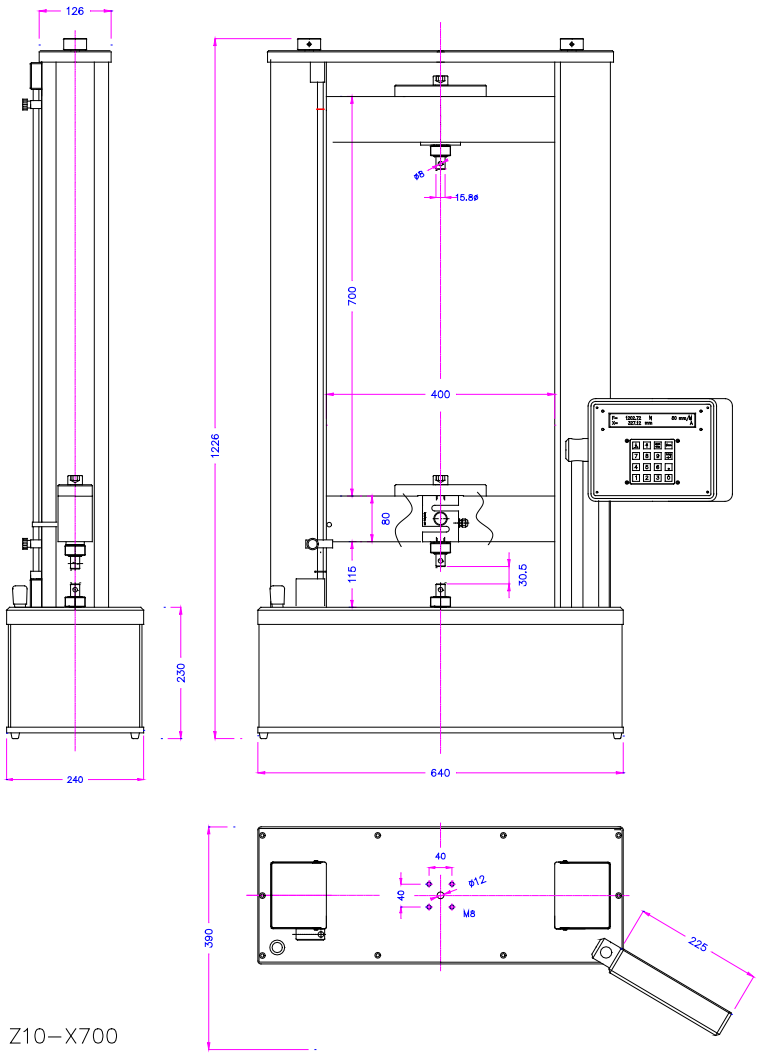






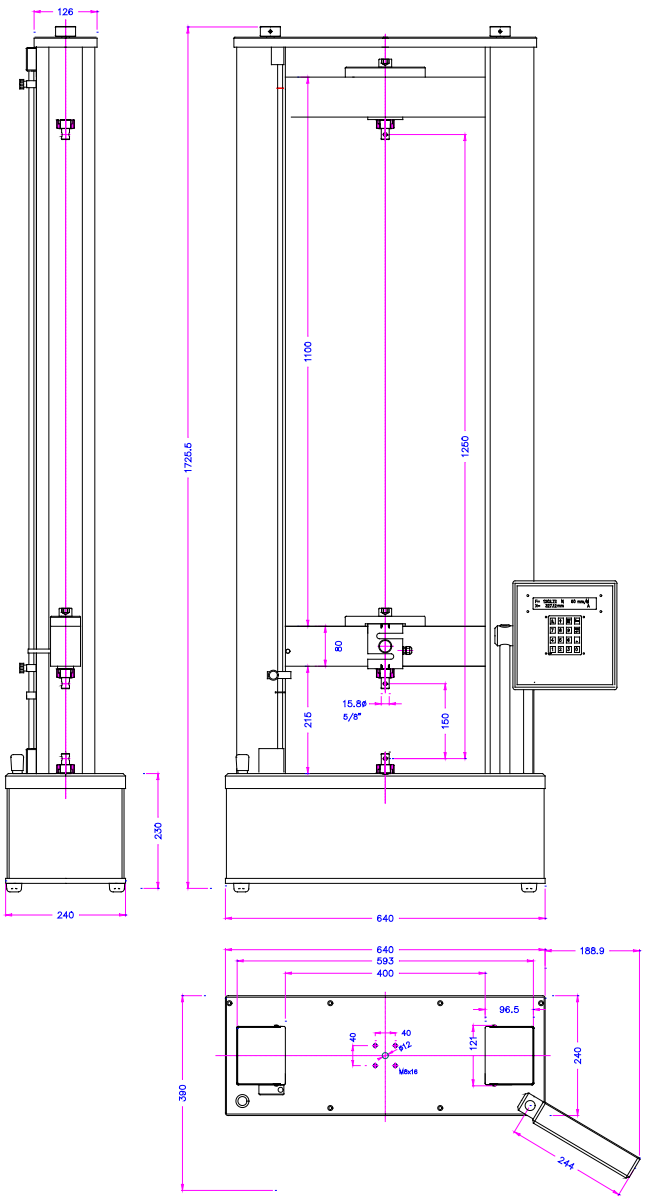
Z3−X500
Z5−X500

	
Z3-X1200	Z3-1200 Z5-1200

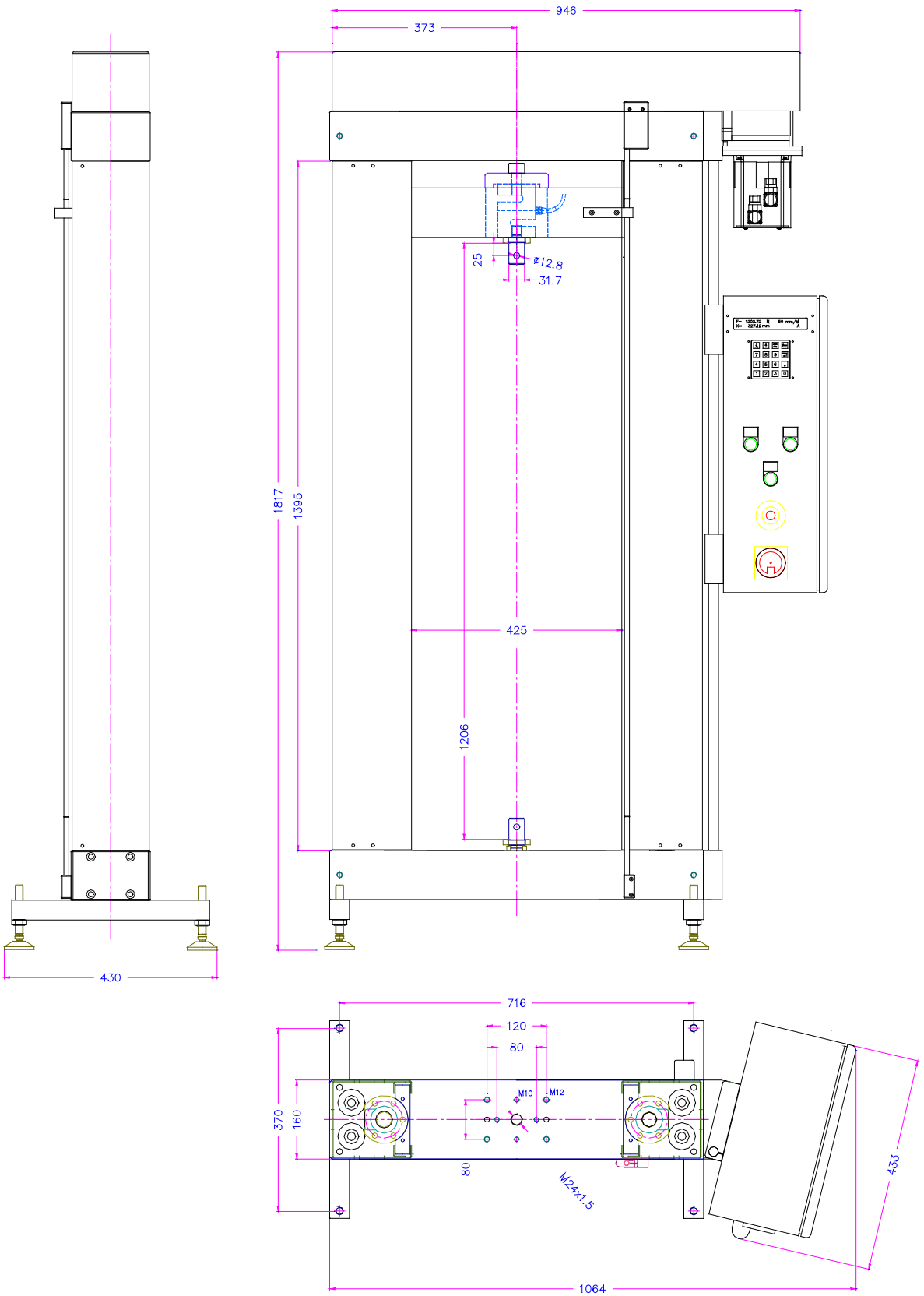


Z10-X700
10kN
700mm

Z10-X700-W600 inner width 600mm



Z10-X1200-pdr


946
373
1817
1395
25
Ø12.8
31.7
425
1206
430
716
120
80
370
160
M10
M12
80
M24x1.5
433
1064

Z20 –1200 Z50-1200

15) Declaration of Conformity

Test - Certificate

Testing machine: Z3, Z5, Z10, Z20, Z50
Serial number:

customer:

The testing machine listed above meets the requirements of DIN 51 221st
It is capable of acceptance by class 1

The load cells are used for calibration are approved as certified equipment, which will be reviewed by the LGA Nuremberg.

Load cell: Nr

Non-linearity: 0.03%
Hysteresis: 0.015%

Manufacturer Nordic NTT

The load cell is capable of acceptance.

24.1.2014 *Unterschrift*

Thümler GmbH *grip - engineering*

Hans Traut Str. 25 *90455 Nürnberg* *Germany*
Tel.: 09122-78711 *Fax.: 09122-73127* *info@grip.de*

Declaration of Conformity

name and location of producer:: *Thümler GmbH 90455 Nürnberg Hans Traut Str. 25*

name of machine *small tensile tester Z3, Z5, Z10,Z20, Z50*

directives compiled with

European CE Health and Safety Directives
EN 50081-1, 580081-1, und EN 61010-1 und EWG 91/368, EWG 93/44
VDE 0100, VDE 0106, DIN 57113 / EN 60204, VDE 0160, VDE 0660
BVG A1, BVG A3
2006/95/ EG low Voltage Directive

2006/95/EG Voltage limits
2004/108/EG electromagnetic compatibility
DIN EN 61000-4-2; VDE 0847-4-2:2009-12:2009-12 EMV
DIN EN 61496-1; VDE 0113-201:2009-03:2009-03 saftey of machines

responsible *M. Thümler Dipl. Ing. (Univ.) Maschinenbauing.*

function *Line, development, conception, construction*
registered into the following handicrafts registers
- Elektromechanikerhandwerk Lfd. Nr. 92/09/132 BNR 0052159
- Maschinenbauerhandwerk Lfd. Nr. 87/13/062 BNR 0052159

Nürnberg, den 24.12.2012

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MT15.1.2015